

REMARKS

Claims 1-26 are pending.

Claims 2-3 and 11-22 are cancelled without prejudice.

Claims 1-2 and 7-10 were rejected.

Claims 3-6 were objected to.

Claim 1 was rejected under 35 U.S.C. 102(e).

Claims 2 and 7-10 were rejected under 35 U.S.C. 103(a).

No new matter is added.

Claims 1, 4-10 and 23-26 remain in the case for consideration.

Applicant requests reconsideration and allowance of the claims in light of the above amendments and following remarks.

Interview Summary

A telephone interview was conducted between the Examiner and Applicant's representative, Brian Wichner, on June 8, 2006. During that interview, Applicant's representative and the Examiner discussed draft amendments presented by fax the day before. The Examiner noted that the amendments to overcome the cited art, Johnson, et al., may overcome the cited art, but more time, and possibly a further prior art search would need to be taken before allowing the claims.

Election/Restrictions

Applicant's election of Species I in the reply filed on April 25, 2005, is acknowledged.

Allowable Subject Matter

The Examiner objects to claims 3-6 as being dependent upon a rejected base claim, but acknowledges that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim (claim 1) and any intervening claims (claim 2). Thus, claim 1 has been amended to include all of the limitations of claims 2 and 3.

Claim Rejections – 35 U.S.C. § 102

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,534,374 to Johnson, et al. (“Johnson”).

Applicant respectfully traverses the rejection.

As discussed briefly above, claim 1 has been amended to include all of the limitations of claims 2 and 3. According to the Examiner, this places claim 1 in condition for allowance.

Claim Rejections – 35 U.S.C. § 103

Claims 2 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson in view of U.S. Patent No. 6,479,391 to Morrow, et al. (“Morrow”).

Claims 2 and 7-10 depend from claim 1 and inherently include all of the limitations of the base claim. As discussed above, the prior art does not teach the limitations of the base claim much less the further limitations of the dependent claims. Therefore, these claims are allowable for their dependency and their own merits. Allowance of these claims is requested.

Double Patenting

Claim 1 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 14 of U.S. Patent No. 6,989,313.

New Claims

New claims 23-25 are similar to original claim 1, but with added limitations that are discussed in detail below. These claims are also not anticipated by Johnson, or any other cited art.

Claim 23 is essentially a modified original claim 1 that has been amended to include the limitation that the first wiring layer’s top surface is located at or below the lower electrode’s bottom surface. An embodiment of this limitation is shown in FIG. 5, for example. In the figure, first wiring layer 112 has a top surface that is at the same level as the bottom surface of the lower electrode 120.

The Examiner relies on Johnson to anticipate all of the limitations of original claim 1, but Johnson fails to anticipate or show a wiring layer’s top surface at or below a lower electrode’s bottom surface. For example, referring to FIG. 10, the Examiner discusses a first wiring layer 28

that is located below or in the same level with the lower electrode 26. But the *top surface* of Johnson's first wiring layer 28 is not at or below the *bottom surface* of Johnson's lower electrode, as new claim 23 requires.

Claim 24 recites at least several limitations that are not anticipated by Johnson. For example, claim 24 recites forming a non-planer dielectric layer 130 on the entire surface of a substrate on which the lower electrode 120 and the first wiring layer 112 are formed so that the non-planer dielectric layer 130 includes steps to cross up and over the lower electrode (refer to the embodiment of FIG. 5, for example). These steps are part of the capacitor structure that allows the lower electrode to reside on top of the lower interlayer dielectric layer 105 instead of being buried within this layer, as is the first wiring layer.

But FIG. 10 of Johnson, for example, fails to show this limitation. Johnson's dielectric layer 30' is planer and does not include steps to cross over the lower electrode 26. Johnson's lower electrode 26 is at the same level as the first wiring layer 28, both residing in an insulation layer 20, so no steps are needed for the dielectric layer 30'. Thus, the structure recited in claim 24 and the structure taught by Johnson are fundamentally different, and Johnson fails to anticipate this claim.

Claim 25 recites forming the upper electrode comprising a single conductive layer. FIG. 5, for example, shows this with upper electrode 140 being a single conductive layer.

Johnson, on the other hand, teaches, as in FIG. 10, an upper electrode comprising the conductive layers 32', 40, and 99. Each of these layers is conductive (col. 7, lines 9 and 32, and col. 8, line 18). But claim 25 requires the upper electrode to comprise a single conductive layer.

Furthermore, claim 26 requires the upper electrode to contact both the first wiring layer through the contact hole and a top surface of the dielectric layer. For example, as shown in FIG. 5, the upper electrode 140 contacts both the first wiring layer 112 through the contact hole C/H1 and the top surface of the dielectric layer 130.

But Johnson fails to show an upper electrode comprising a single conductive layer that also contacts both the first wiring layer through the contact hole and the top surface of the dielectric layer. Instead Johnson shows a single layer 99, among the layers 32', 40, and 99 that comprise the upper electrode, that fails to contact both the first wiring layer 28 and the top surface of the dielectric layer 30'. Single layer 99 only contacts an edge of the dielectric layer

30', wherein contacting the top surface would allow for a much greater contact surface area, which results in an efficient capacitor design.

Conclusion

For the foregoing reasons, reconsideration and allowance of the claims of the application as amended is requested. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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